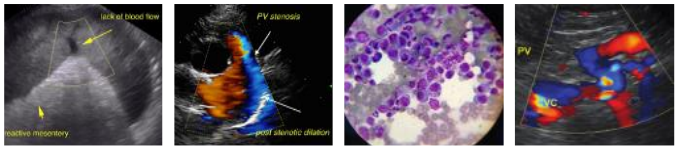
SonoPath
Clinical Sonography & Telecytology
EDUCATIONAL TELECONSULTATION SERVICES™
SonoPath.com
1-800-838-4268 info@sonopath.com



PATIENT
Fritz Steilein

SPECIES
Canine

BREED
Terrier Mix

SEX
Male Neutered

AGE
12 years

WEIGHT
22lbs

INTERPRETED BY
Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY
Dave Stasiuk, RDMS, RDCS

HOSPITAL NAME
Silverado Veterinary Clinic

REFERRING VET
Dr. Marahar

INVOICE
27003

DATE
10/19/22

PRESENTING CLINICAL SIGNS

History: Grade 5/6 heart murmur.

ECHOCARDIOGRAM FINDINGS

2D, m-mode, color flow and doppler imaging is available. Diffuse thickening of mitral valve leaflets with mild prolapse into the left atrial lumen. Moderate eccentric mitral regurgitation with moderate atrial enlargement. Minimal LV dilation with adequate function. Subtle septal flattening noted in end-systole. The tricuspid valve appears thickened with severe tricuspid regurgitation. TR velocity consistent with moderate pulmonary hypertension however this is likely an under-estimation. Moderate to severe RA/RV dilation with mild RVH. Mildly dilated MPA and branches. The pulmonic and aortic valves are normal in morphology and mobility. No obvious aortic or pulmonic insufficiency. Normal pulmonic and aortic outflow velocities. No pericardial or pleural effusion noted. No cardiac tumors observed.

CARDIAC CHART

CANINE CARDIAC PARAMETERS	MR VMAX (m/s)	TR VMAX (m/s)	LA/AO (Boon method)	LA/AO (Heart Base; Swe)	FS (%)	EF (%)	EPSS (cm)
NORMAL PARAMETER	4.5-5.5	<2.7	1.3	<1.6	28-40	40-100	<0.6
PATIENT	NM	3.6	NM	1.8	50	92	NM

CANINE CARDIAC PARAMETERS	HR (BPM)	AV VMAX (m/s)	PV MAX (m/s)	BODY WEIGHT (kg)	LA 2D short axis Base view (cm)	LVIDd Avg; 2D and m-mode short axis (cm)	LVIDs Avg; 2D and m-mode short axis (cm)
NORMAL PARAMETER	50-100	0.7-1.7	0.7-1.6	BELOW	BELOW	BELOW	BELOW
PATIENT	NM	1.1	1.0	10.0	3.5	4.0	2.0

*Normal chamber parameters expressed as a mean value (SD)

BODY WEIGHT DEPENDENT PARAMETERS

**Note: All measurements based upon multi-modal images and methods. An average value is reported.*

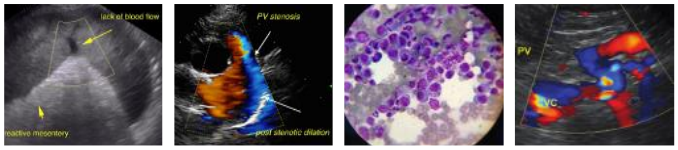
Adapted from June Boon, Veterinary Echocardiography, 1998
Rishniw M and Hollis NE, J Vet Intern Med 2000; 14:429-435
Hansson et al, Vet Rad and Ultrasound 2002
Bonagura et al. Echocardiography: principles of interpretation, Vet Clin North Am 15:1177, 1995

3	1.27 (5.3)	2.46 (2.46)	1.36 (5.5)
5	1.40 (4.5)	2.74 (5.2)	1.60 (4.7)
10	1.50 (3.8)	3.27 (3.5)	2.06 (3.1)
15	1.83 (2.0)	3.71 (2.4)	2.43 (2.1)
20	2.02 (1.9)	4.14 (2.2)	2.80 (2.0)
25	2.18 (2.4)	4.48 (2.9)	3.10 (2.5)
30	2.33 (3.3)	4.83 (3.9)	3.39 (3.4)
35	2.48 (4.3)	5.17 (5.0)	3.69 (4.5)
40	2.62 (5.2)	5.48 (6.1)	3.96 (5.4)
50	2.88 (7.1)	6.07 (8.3)	4.46 (7.4)

INTERPRETATION OF THE FINDINGS & FURTHER RECOMMENDATIONS

The most significant finding is moderate to severe pulmonary hypertension as evidenced by an elevated TR velocity in addition to RA/RV/MPA dilation. The estimated systolic pulmonary arterial pressure is 60-80mmHg, with normal being <25mmHg. This is based upon the secondary right heart changes, as the TR velocity appears to be an under-estimation. There is also hemodynamically significant left heart disease with moderate mitral regurgitation and moderate left atrial enlargement.

Clinical signs of weakness, heavy breathing, cyanosis, and syncope are attributed to severe PAH. The underlying genesis of PAH is poorly understood in cases other than heartworm infestation or known PTE, though it occurs with increased frequency in a variety of forms of airway disease and



SonoPath.com
1-800-838-4268 info@sonopath.com

PATIENT
Fritz Steilein

SPECIES
Canine

BREED
Terrier Mix

SEX
Male Neutered

AGE
12 years

WEIGHT
22lbs

INTERPRETED BY
Maggie Machen Lamy, DVM, DACVIM (Cardiology)

IMAGING PERFORMED BY
Dave Stasiuk, RDMS, RDCS

HOSPITAL NAME
Silverado Veterinary Clinic

REFERRING VET
Dr. Marahar

INVOICE
27003

DATE
10/19/22

in patients with idiopathic pulmonary fibrosis. If not performed, a heartworm antigen test is recommended. Without a case history of respiratory disease, the underlying cause is open.

Given the degree of right heart enlargement, Sildenafil and Pimobendan are recommended as below. If respiratory signs are present, these are likely primary airway in origin and broad-spectrum antibiotic therapy, bronchodilators, etc. may be useful. It is important to note that pulmonary hypertension is rarely primary; more often it has developed secondary to primary airway disease. Patients with right heart changes secondary to PAH can eventually develop right-sided congestive heart failure (ascites), debilitating cyanosis and labored breathing and exertional syncope if poorly controlled.

Omega fatty acid supplementation and mild salt restriction may be of some long-term benefit.

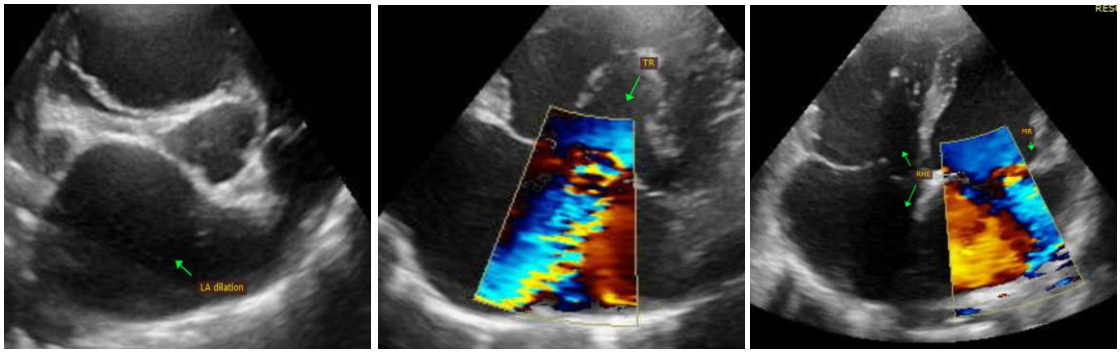
Monitor for development of a labored breathing, worsening cough, exercise intolerance or collapse episodes in the future.

Elective anesthesia is not advised.

PLAN:
Institute sildenafil 1-2mg/kg PO q8h. Administer Pimobendan 0.25-0.3mg/kg PO q12h. Consider airway workup/treatment depending on clinical signs.

Recommend recheck echocardiogram in 6 months to reassess structure and function, sooner if any development of clinical signs.

IMAGES



The information and recommendations provided are based on the images presented by the referring veterinarian. No evaluation can be communicated regarding pathology that was not visible in the image/video clips provided.

Thank you for this referral. This report was generated using transcription software, and minor dictation errors may be present. If the clinical or image interpretation does not parallel your findings or if I can be of any further assistance, please contact me.

Maggie Machen Lamy, DVM
Diplomate of the American College of Veterinary Internal Medicine (Cardiology)
info@sonopath.com